

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
 US Department of Commerce
 United States Patent and Trademark
 Office, PCT
 2011 South Clark Place Room
 CP2/5C24
 Arlington, VA 22202
 ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 30 May 2001 (30.05.01)	
International application No. PCT/US00/12251	Applicant's or agent's file reference GM50053
International filing date (day/month/year) 04 May 2000 (04.05.00)	Priority date (day/month/year) 07 May 1999 (07.05.99)
Applicant BROWN, James, R. et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

08 November 2000 (08.11.00)

☐ in a notice effecting later election filed with the International Bureau on:2. The election ☒ was☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Zakaria EL KHODARY Telephone No.: (41-22) 338.83.38
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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference GM50053	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/US00/12251	International filing date (day/month/year) 04 MAY 2000	Priority date (day/month/year) 07 MAY 1999
International Patent Classification (IPC) or national classification and IPC Please See Supplemental Sheet.		
Applicant SMITHKLINE BEECHAM CORPORATION		

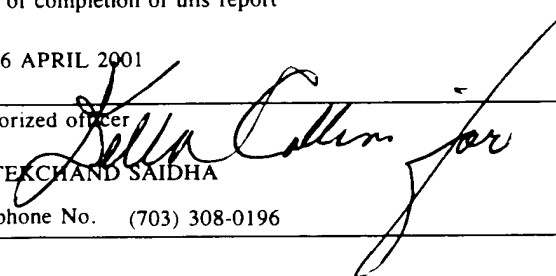
1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority. (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 0 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☒ Non-establishment of report with regard to novelty, inventive step or industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 08 NOVEMBER 2000	Date of completion of this report 16 APRIL 2001
Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	Authorized officer  TEJCHAND SAIDHA
Facsimile No. (703) 305-3230	Telephone No. (703) 308-0196

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US00/12251

I. Basis of the report**1. With regard to the elements of the international application:***☒ the international application as originally filed☒ the description:

pages 1-39, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of

☒ the claims:

pages 40-53, as originally filed
pages NONE, as amended (together with any statement) under Article 19
pages NONE, filed with the demand
pages NONE, filed with the letter of

☒ the drawings:

pages 1-6, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of

☒ the sequence listing part of the description:

pages 1-6, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).☐ the language of publication of the international application (under Rule 48.3(b)).☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).**3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:**☒ contained in the international application in printed form.☐ filed together with the international application in computer readable form.☐ furnished subsequently to this Authority in written form.☐ furnished subsequently to this Authority in computer readable form.☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.**4. ☒ The amendments have resulted in the cancellation of:**☒ the description, pages NONE☒ the claims, Nos. NONE☒ the drawings, sheets/fig. NONE**5. ☐ This report has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).****

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

**Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/US00/12251**III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been and will not be examined in respect of:

☐ the entire international application.

☒ claims Nos. 13, 15, 17-20

because:

☐ the said international application, or the said claim Nos. _ relate to the following subject matter which does not require international preliminary examination (*specify*).

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. _ are so unclear that no meaningful opinion could be formed (*specify*).

☐ the claims, or said claims Nos. _ are so inadequately supported by the description that no meaningful opinion could be formed.

☒ no international search report has been established for said claims Nos. 13, 15, 17-20.

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the standard.

☐ the computer readable form has not been furnished or does not comply with the standard.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US00/12251

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. statement

Novelty (N)

Claims 1-12, 14, 16, 21-42

YES

Claims NONE

NO

Inventive Step (IS)

Claims 1-12, 14, 16, 21-42

YES

Claims NONE

NO

Industrial Applicability (IA)

Claims 1-12, 14, 16, 21-42

YES

Claims NONE

NO

2. citations and explanations (Rule 70.7)

Claims 1-12, 14, 16 and 21-42 meet the criteria set out in PCT Article 33(2)-(4), because the prior art does not teach or fairly suggest the claimed isolated polynucleotide, vector, host cell and method of making the polypeptide, or antagonists that inhibit the polypeptide expression, or the methods associated with the novel polypeptide or inhibitor compounds. O'Connell et al. teach *aroA* gene of *Staphylococcus* encoding an EPSP synthase. The claimed *Streptococcus pneumoniae* DNA sequence encoding the amino acid sequence of SEQ ID NO : 2 having 70 % homology or methods based upon the sequences, is outside the range of teachings of O'Connell et al.

Claims 1-12, 14, 16 and 21-42 meet the criteria set out in PCT Article 33(4), because the subject matter claimed can be made or used in industry.

----- NEW CITATIONS -----

O'CONNELL et al. Sequence and Mapping of the *aroA* gene of *Staphylococcus aureus* 8325-4. *Journal of General Microbiology*. 1993, Vol. 139, pages 1449-1460, see the entire document.

MAJUMDER et al. 5-Enolpyruvylshikimate-3-phosphate synthase of *Bacillus subtilis* is an allosteric enzyme. *Eur. J. Biochem.* 1995, Vol. 229, pages 99-106, see the entire document.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US00/12251

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII

Sheet 10

CLASSIFICATION:

The International Patent Classification (IPC) and/or the National classification are as listed below:

IPC(7): CO7H 21/04; C12P 21/06; C12N 1/20, 15/00 and US Cl.: 536/23.1, 23.7; 435/69.1, 69.2, 252.3, 320.1

PCTWORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 7 : C07H 21/04, C12P 21/06, C12N 1/20, 15/00		A1	(11) International Publication Number: WO 00/68243
			(43) International Publication Date: 16 November 2000 (16.11.00)
(21) International Application Number: PCT/US00/12251		(74) Agents: GIMMI, Edward, R. et al.; SmithKline Beecham Corporation, Corporate Intellectual Property, UW2220, 700 Swedeland Road, P.O. Box 1539, King of Prussia, PA 19406-0939 (US).	
(22) International Filing Date: 4 May 2000 (04.05.00)			
(30) Priority Data: 60/133,070 7 May 1999 (07.05.99) US		(81) Designated States: JP, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).	
(71) Applicants (for all designated States except US): SMITHKLINE BEECHAM CORPORATION [US/US]; One Franklin Plaza, Philadelphia, PA 19103 (US). SMITHKLINE BEECHAM PLC [GB/GB]; New Horizons Court, Great West Road, Brentford, Middlesex TW8 9EP (GB).		Published With international search report	
(72) Inventors; and (75) Inventors/Applicants (for US only): BROWN, James, R. [CA/US]; 9 Robins Lane, Berwyn, PA 19312 (US). CHALKER, Alison, F. [GB/US]; 137 Havard Drive, College Woods, Trappe, PA 19426 (US). KATZ, Lisa, K. [US/US]; 6 East Park Road, Newtown, PA 18940 (US). MAZZULLA, Marie, Jean [US/US]; 2029 Greenes Way Circle, Collegeville, PA 19426 (US). PAYNE, David, J. [GB/US]; 618 Waterfall Way, Phoenixville, PA 19460 (US). TRAINI, Christopher, M. [US/US]; 50 Potter Court, Media, PA 19063 (US). DU, Wengsheng [CN/US]; 406 Meadowview Lane, Mont Clare, PA 19453 (US).			
(54) Title: METHODS USING MECHANISMS OF ACTION OF AROA			
(57) Abstract The invention provides aroA polypeptides and DNA (RNA) encoding aroA polypeptides and methods for producing such polypeptides by recombinant techniques. Also provided are methods for utilizing aroA polypeptides to screen for antibacterial compounds.			

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
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BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
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CM	Cameroon	KZ	Kazakhstan	PT	Portugal		
CN	China	LC	Saint Lucia	RO	Romania		
CU	Cuba	LI	Liechtenstein	RU	Russian Federation		
CZ	Czech Republic	LK	Sri Lanka	SD	Sudan		
DE	Germany	LR	Liberia	SE	Sweden		
DK	Denmark			SG	Singapore		
EE	Estonia						

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US00/12251

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C07H 21/04; C12P 21/06; C12N 1/20, 15/00

US CL : 536/23.1, 23.7; 435/69.1, 69.2, 252.3, 320.1

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 536/23.1, 23.7; 435/69.1, 69.2, 252.3, 320.1

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

West and STN files : medline, caplus, uspatfull, biosis, scisearch - search terms : araA gene? and streptococcus pneumoniae.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P	US 5,883,239A (BROWN ET AL.) 16 March 1999 (16.3.1999), see entire document, especially the abstract.	1-12, 14, 16, 21-42

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory made known the invention
A document defining the general state of the art which is not considered to be of particular relevance	*X* document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
E earlier document published on or after the international filing date	*Y* document of particular relevance, the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*G* document member of the same patent family
O document referring to an oral disclosure, use, exhibition or other means	
P document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

25 JULY 2000

Date of mailing of the international search report

10 AUG 2000

Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

TEKCHINAE SAIDHA

Telephone No. (703) 308-0196

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US00/12251**Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)**

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Please See Extra Sheet.

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
1-12, 14, 16 & 21-42
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US00/12251

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING

This ISA found multiple inventions as follows:

This application contains the following inventions or groups of inventions which are not so linked as to form a single inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

Group I, claim(s) 1-12, drawn to polynucleotide encoding *aroA* polypeptide, vector host cells and method of making the polypeptide.

Group II, claim(s) 13, drawn to antibody against the polypeptide of claim 11.

Group III, claim(s) 14, 16 & 21-42, drawn to antagonists and method of use.

Group IV, claim(s) 15 drawn to a method of treatment using *aroA*.

Group V, claim(s) 17, drawn to Process of diagnosing a disease.

Group VI, claim(s) 18, drawn to polypeptide inhibitors

Group VII, claims 19-20, drawn to a method of inducing an immunological response.

The inventions listed as Groups I-VII do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The

Polynucleotide of Group I and the antibody of Group II do not require each other for their practice, have separate utilities, such as the polynucleotide of Group I can be used for recombinant expression of the *aroA* polypeptide versus the use of antibody to detect proteins. Group I has a special technical feature of nucleotide sequence encoding *aroA* which Groups II-VII do not share; Group II has the special technical feature of an antibody which Group I and III-VII do not share. Group III has the special technical feature of an antagonist, which Groups I-II and Groups IV-VII do not share; Group IV has the special technical feature of an a treatment based upon *aroA* polypeptide, which Groups I-III and Groups V-VII do not share; Group V has the special technical feature of a process for diagnosis of disease based upon expression of protein, which Groups I-IV and Groups VI-VII do not share; Group VI has the special technical feature of an of a method for identifying compounds which inhibit polypeptide activity, which Groups I-V and Groups VII do not share; Group VII has the special technical feature of a method for inducing an immunological response, which Groups I-VI do not share.

SEQUENCE LISTING

<110> SMITHKLINE BEECHAM CORPORATION
SMITHKLINE BEECHAM plc

<120> METHODS USING MECHANISMS OF ACTION OF
AroA

<130> GM50053

<140> TO BE ASSIGNED

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 Glu Ile Glu Asp Lys Asp Gly Val Ile Thr Val Gln Gly Val Gly Met
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 Ala Gly Leu Lys Ala Pro Gln Asn Ala Leu Asn Met Gly Asn Ser Gly
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 Thr Ser Ile Arg Leu Ile Ser Gly Val Leu Ala Gly Ala Asp Phe Glu
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 Val Glu Met Phe Gly Asp Asp Ser Leu Ser Lys Arg Pro Met Asp Arg
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 Val Thr Leu Pro Leu Lys Lys Met Gly Val Ser Ile Ser Gly Gln Thr
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 Glu Arg Asp Leu Pro Pro Leu Arg Phe Lys Arg Asp Glu Lys Pro Lys
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 Thr Tyr Ser Leu Xaa Val Ala Asn Cys Leu Cys Pro Ser Gln Val Ser
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 Lys Glu Tyr Thr Arg Asn His Thr Glu Asp Met Leu Gln Gln Phe Gly
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 Lys Leu Thr Gly Gln Lys Val Val Val Pro Gly Asp Ile Ser Ser Ala
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 Ala Phe Trp Leu Val Ala Gly Leu Ile Ala Pro Asn Ser Arg Leu Val
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 Leu Gln Asn Val Gly Ile Asn Glu Thr Arg Thr Gly Ile Ile Asp Val
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 Ile Arg Ala Met Gly Gly Lys Leu Glu Ile Thr Glu Ile Asp Pro Val
 260 265 270
 Ala Lys Ser Ala Thr Leu Ile Val Glu Ser Ser Asp Leu Lys Gly Thr
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 Glu Ile Cys Gly Ala Leu Ile Pro Arg Leu Ile Asp Glu Leu Pro Ile
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Ile Ala Leu Leu Ala Thr Gln Ala Gln Gly Val Thr Val Ile Lys Asp
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Ala Glu Glu Leu Lys Val Lys Glu Thr Asp Arg Ile Gln Val Val Ala
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